FLUENCY AND LANGUAGE

WHAT IS FLUENCY?

icient, accurate recall of
number facts and
cedures is essential FOR
ncy, freeing pupils'
ds to think deeply about
ncepts and problems, but
ncy demands more than
."

WHAT IS FLUENCY?

equires pupils to have flexibility to move ween different contexts d representations of thematics, to recognise tionships and make nnections, and to choose opropriate methods and tegies to solve blems."

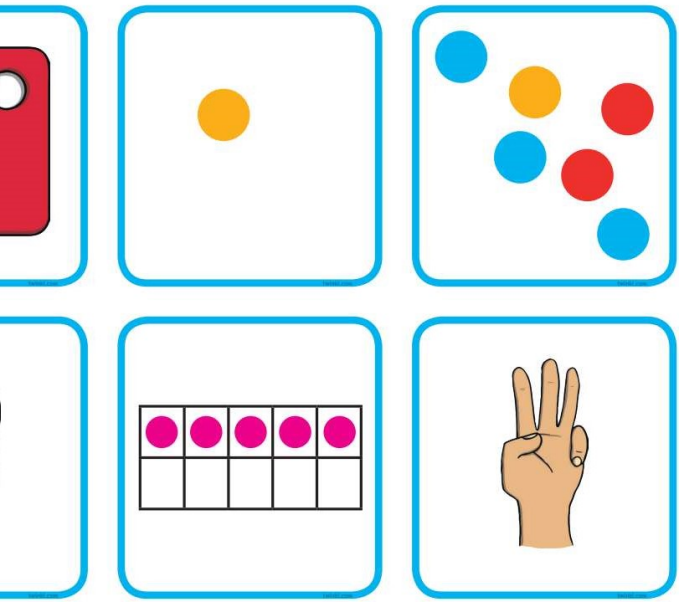
To move between differen contexts and represent

To recognise relationships make connections

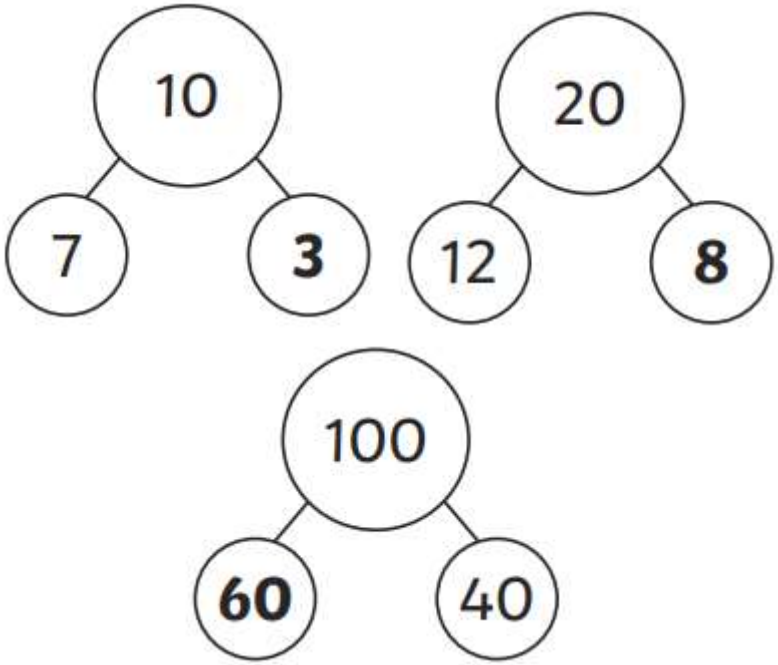
To choose appropriate methods and strategies solve problems.

WHAT IS MEANT BY KEY NUM
FACTS AND PROCEDURES

Subitising



Number bonds



Multiplication ta

×	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81
10	10	20	30	40	50	60	70	80	90
11	11	22	33	44	55	66	77	88	99
12	12	24	36	48	60	72	84	96	108

THE OUTCOMES WHEN FLUENCY I
NOT DEVELOPE

ounger pupils' inability to subitise or easily recall addition facts
ampers their progress. They may be able to understand a
achers' instruction in, for example, Year 2 or 3, but they struggle
complete tasks with the speed and accuracy of their peers. The
ventually obtain the correct answers ('getting by'), thus
emonstrating their understanding, but are less likely to remembe
is new knowledge. This cycle continues, but with pupils
creasingly unable to understand, let alone apply, new knowledge
his is likely to be one of the reasons why interventions are so
biquitous in Year 6: pupils' internal struggles manifest after a
gnificant amount of time has elapsed.

LET'S THINK…

n knows 7 X 12 is 84.

y works out 7 x 12 by doing 7 x 10 and 7 x 2 then adding the products together."

o is the better mathematician? Why?

EARNING FACTS IS A JOURNEY.

t by having a strategy to work it out and understanding the mathematical structures behi t.

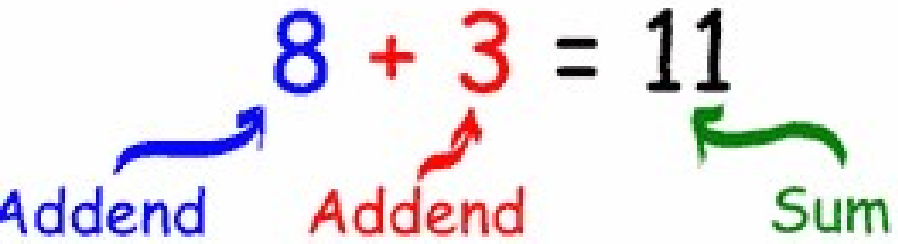
ctise until you reach automaticity.

ly it to different contexts and use it to make link other facts currently unknown.

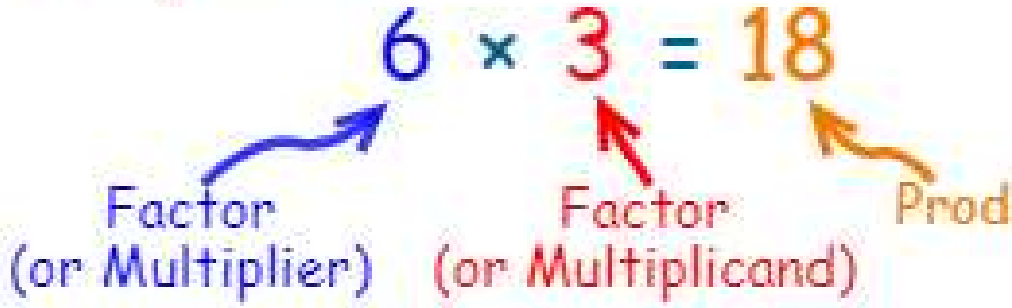
ildren have a strategy and understanding of the concept to start with, they can't ever learn and apply it. N they spend on times table games.

LANGUAGE IS THE KEY….

dition:

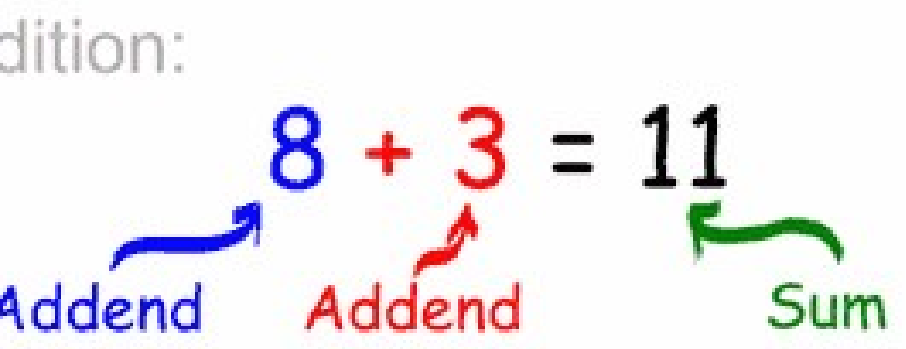


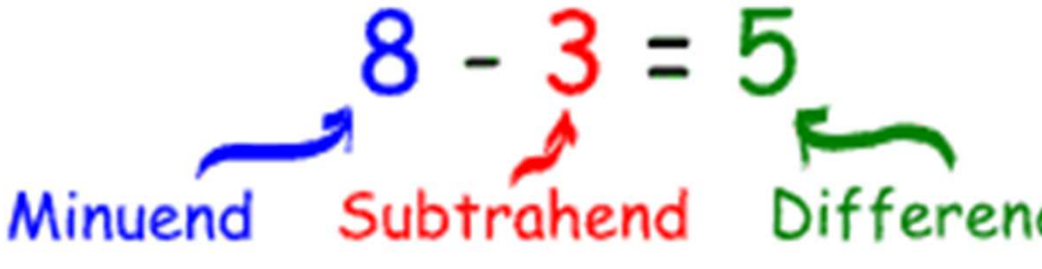
Multiplication:



raction

Division



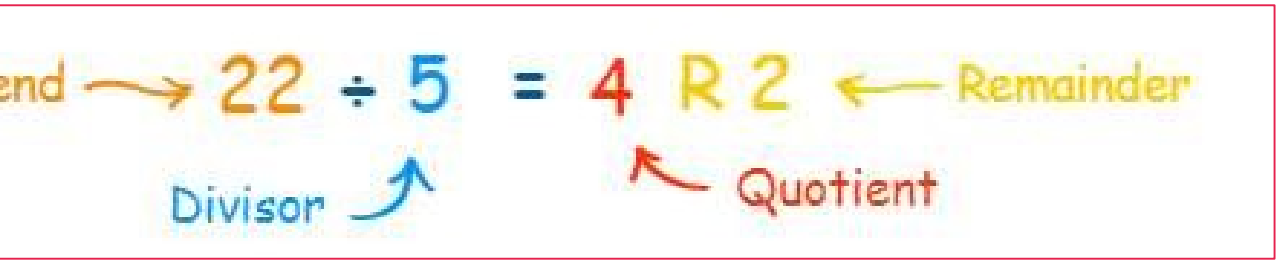


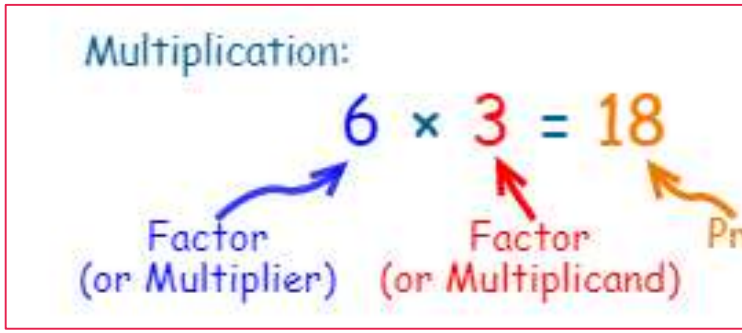
HOW TO GENERALISE? LANGUAGE IS KEY

o addends are commutative.

e order matters for subtraction.

have a positive difference the minuend must be greater than the subtrahe





HOW TO GENERALISE? LANGUAGE IS KEY

odd factors are equal to an odd product.

divisor is 5 and the remainder is 1, what do you notice about the dividend?

actor is 5, the product ends in a 0 or 5.

__ x 5 = _0 or __ x 5 = _5

How many ways?

The missing numbers are positive whole numbers.

$$60 \div \square = 4 \times \square$$

Fill in the missing numbers.

Level 1: I can find a way

Level 2: I can find different ways

Level 3: I know how many ways there are

KS1 EXAMPL

Pairs of Numbers

If you have ten counters numbered 1 to 10, how many can you put into pairs that add to 10?

Can you use them all?
Say how you got your answer.

Now put the counters into pairs to make 12.

- Can you use them all?
- Say how you got your answer.

Now put the counters into pairs to make 13.

- Can you use them all?
- Say how you got your answer.

Now put the counters into pairs to make 11.

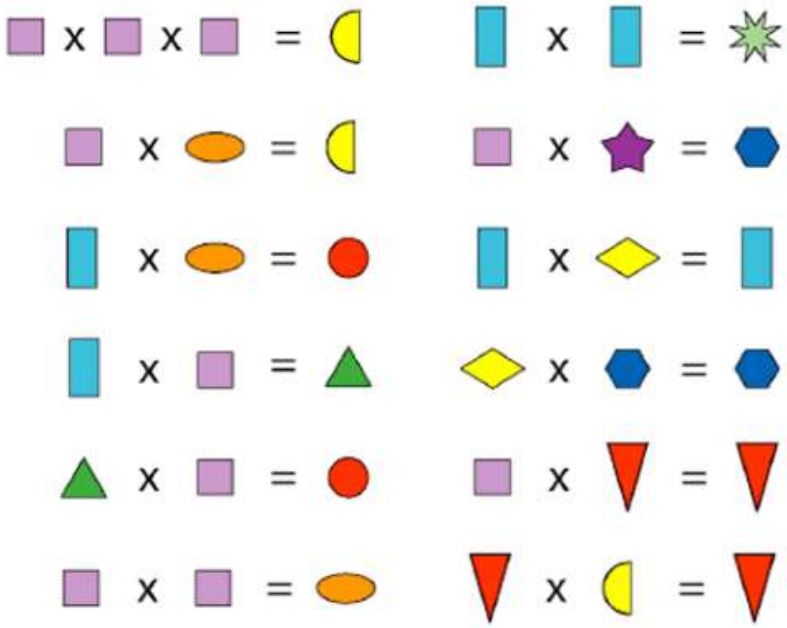
- Can you use them all?
- Say how you got your answer.

KS2 EXAMPL

Shapes Times Shape

The coloured shapes stand for eleven of the numbers from 0 to 12. Each shape is a different number.

Can you work out what they are from the multiplications below?

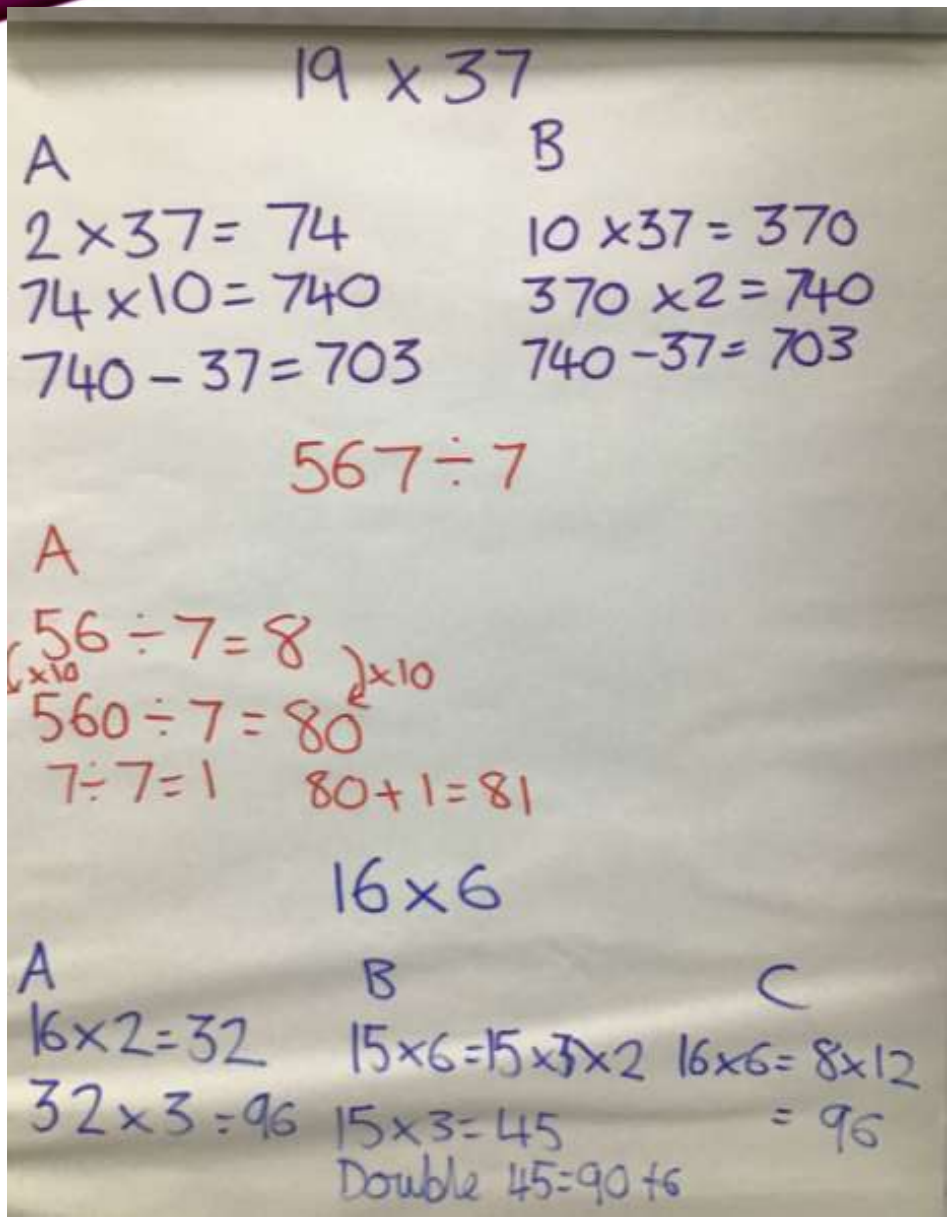


NUMBER TALKS

$19 \times 37 =$

$567 \div 7 =$

$16 \times 6 =$


19 x 37
A
2 x 37 = 74
74 x 10 = 740
740 - 37 = 703
B
10 x 37 = 370
370 x 2 = 740
740 - 37 = 703
567 ÷ 7
A
56 ÷ 7 = 8
x10
560 ÷ 7 = 80
x10
7 ÷ 7 = 1
80 + 1 = 81
16 x 6
A
16 x 2 = 32
32 x 3 = 96
B
15 x 6 = 15 x 3 x 2
15 x 3 = 45
Double 45 = 90 to 6
C
16 x 6 = 8 x 12
= 96

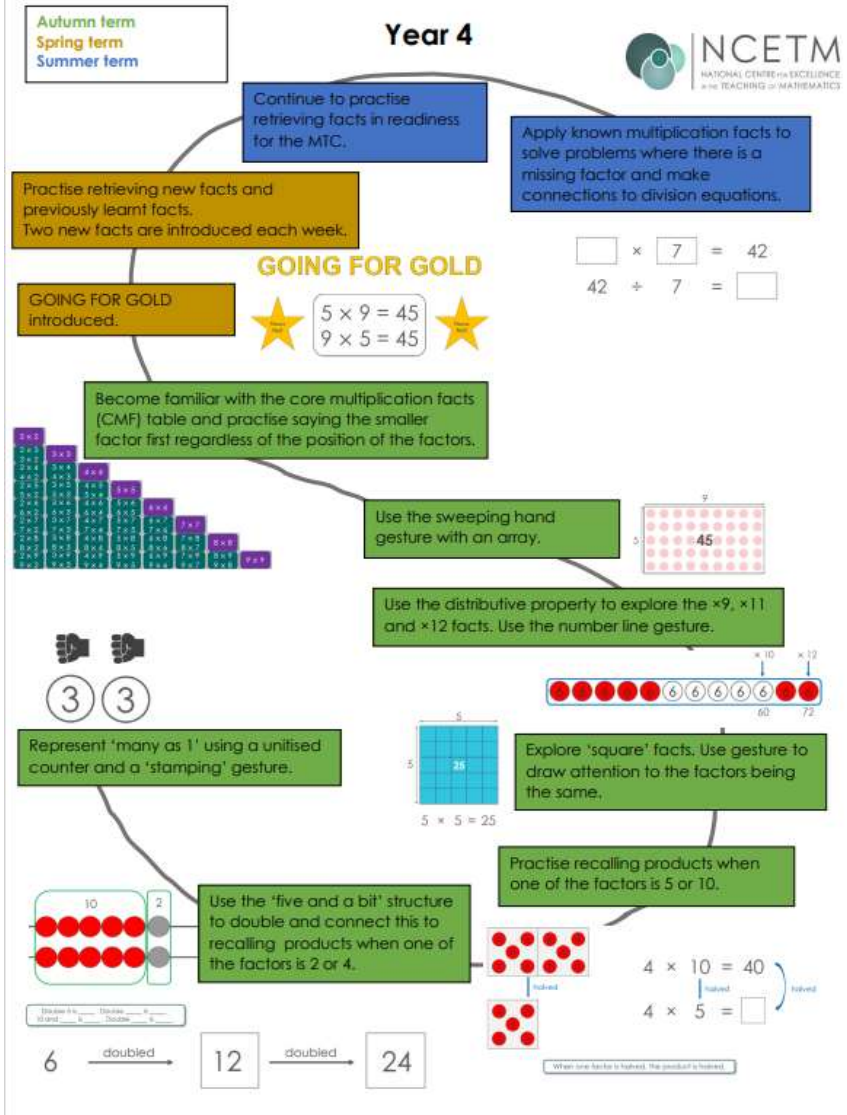
MASTERING NUMBER RECEPTION AND KS

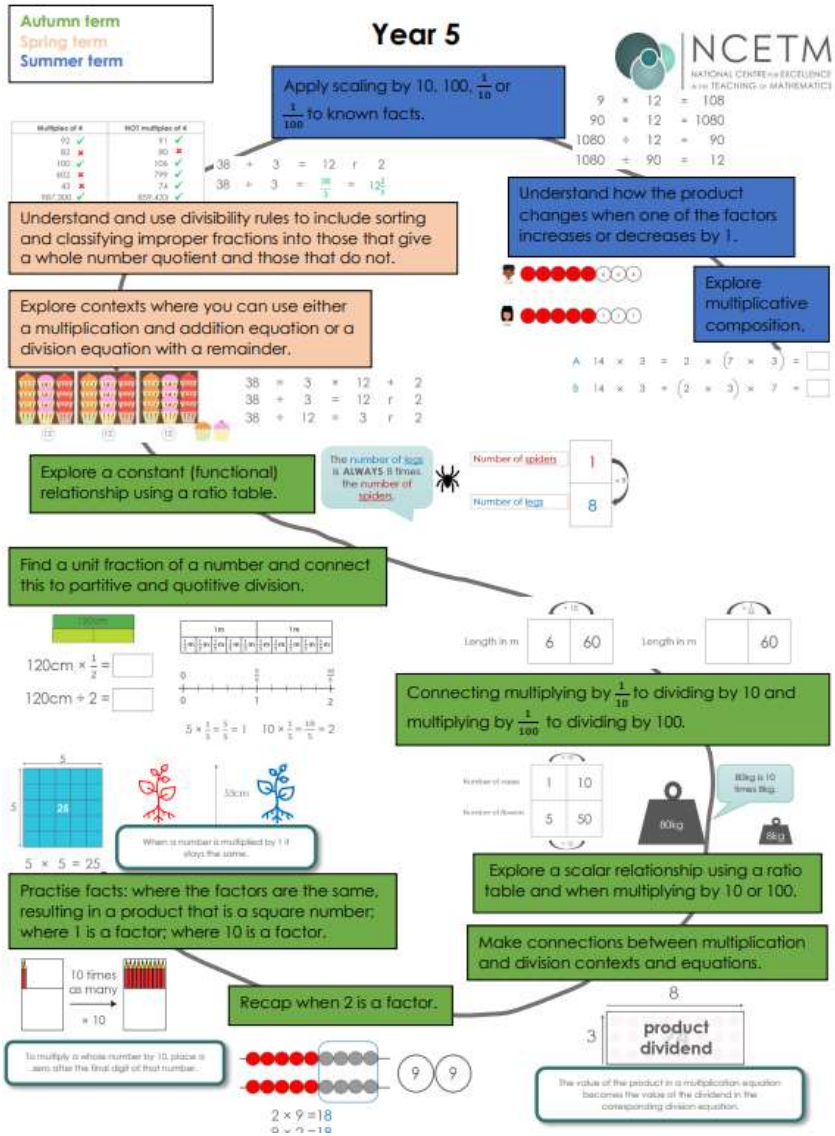
is project aims to secure firm foundations in the development of good umber sense for all children from Reception through to Year 1 and Year 2. e aim over time is that children will leave KS1 with fluency in calculation an confidence and flexibility with number. Attention will be given to key owledge and understanding needed in Reception classes, and progressio rough KS1 to support success in the future.

https://vimeo.com/720204080/51598c196f

https://www.ncetm.org.uk/maths-hubs-projects/mastering-number-at-reception-and-ks1/

MASTERING NUMBER KS





Key Messages

1. Fluency demands more of students than memorisation of a single procedure or collection of facts. It encompasses a mixture of efficiency, accuracy and flexibility.
2. Quick and efficient recall of facts and procedures is important in order for students to keep track of sub-problems, think strategically and solve problems.
3. Fluency also demands the flexibility to move between different contexts and representations of mathematics, to recognise relationships and make connections, and to make appropriate choices from a whole toolkit of methods, strategies and approaches.